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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/557,190

11/18/2005

Lutz Rose

HM-657PCT

7251

40570 7590 04/27/2010
FRIEDRICH KUEFFNER
317 MADISON AVENUE, SUITE 910
NEW YORK, NY 10017

EXAMINER

YANG, JIE

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

04/27/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/557,190
Filing Date: November 18, 2005
Appellant(s): ROSE ET AL.

Klaus P. Stoffel
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 3/15/2010 appealing from the Office action mailed 6/8/2009.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

Claims 1 and 5-11

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

3,807,986	Funk et al	4-1974
6,228,137 B1	Guillot et al	5-2001
EP 0655508 A1	Masucci et al	11-1993

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

Claims 1, 5-8, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Funk et al (US 3,807,986, thereafter US'986) in view of Guillot et al (US 6,228,137, thereafter US'137).

Regarding claim 1, US'986 teaches a steel-making process in electric arc furnaces: "Briquettes, or uniformly sized pieces, formulated according to planned chemical and physical consistencies, introduced by gravity through the slag layer onto, or into, the molten metal bath of an electric arc furnace, during the process of steel making, for refining the metal to a desired steel composition, while making appreciable useful

Art Unit: 1793

additions to the molten metal bath, by controlling the thermal balance and carbon content of the molten bath, and also shielding, at least in part, the refractory wall of the furnace by causing a vigorous boiling action, with erupting slag plumes, which intervene between the arcs and the refractory wall."

(Abstract and Col.1, lines 6-14 of US'986), which reads on the steel melting process in an electric arc furnace as recited in the instant claim. The vigorous boiling action, with erupting slag plumes taught by US'986 reads on forming gases bubbles in the slag-causing the slag foaming. US'986 teaches metallic iron, iron oxide, and carbon in the formulated briquettes (Abstract and Table 2 of US'986) and applying forming rollers to produce the pressed briquettes (Col.9, lines 27-47 of US'986), which reads on the mixture of a metal oxide and carbon as compressed pre-forms as recited in the instant claim. US'986 teaches that the briquettes have an effective density of about 5.5 grams per cubic centimeter (Abstract and claim 4 of US'986), a minimum effective density of about 1.5 times the density of said liquid slag (Claim 9 of US'986), and the briquettes may be introduced by gravity through the slag layer onto the molten metal bath (abstract and claim 9 of US'986), which reads on the limitation of the compressed performs being heavier than the slag but lighter than the metal melt and floating in the slag near a

Art Unit: 1793

phase boundary between the metal melt and the slag as recited in the instant claim.

US'986 does not specify the high-chromium in the steel melts. US'137 teaches a process for producing a foaming slag above stainless steel melted in an electric furnace (Title of US'137). US'137 teaches adding metal oxide and carbon into high-chromium steel melt, particularly a stainless steel melt, in an electric arc furnace (Abstract, field of the invention and claims 1-10 of US'317). Therefore, it would have been obvious to one of ordinary skill in the art to apply the high-chromium melting as demonstrated by US'317 in the steel-making process of US'986 because US'317 teaches: "The slag in foam form coats the end of the electrode and protects the refractories from the electric radiation, and this allows a saving, in the consumption of the electrode, in electricity consumption and in the consumption of the refractories." (Col.1, lines 29-33 of US'137).

Regarding claims 5 and 6, US'986 teaches adjusting the briquette's formula and effective density (Col.3, lines 11-51 and table 1-2 of US'986) and US'986 teaches: "They permit fine control, according to preplanned conditions, of partially overlapping steps of iron unit additions and refining in the steelmaking process and at the same time cost less than known

Art Unit: 1793

other materials that may be utilized for similar purposes."

(Col.52-56 of US'986), which reads on the adjusting density of the preforms as recited in the instant claims.

Regarding claim 7, US'986 teaches the briquettes can have additional materials such as fluxes mixed with them to produce self fluxing characteristics (Col.2, lines 64-68 of US'986).

Regarding claim 8, US'986 does not explicitly teach the addition of CaF_2 to the briquette. However, US'986 teach that the briquette may have additional different materials mixed with them to produce desirable properties and effects and teaches the addition of fluorspar, a mineral composed of CaF_2 , as being a known additive in an electric furnace steelmaking process (Col.1, lines 15-17, Col.1, lines 31-37, and Col.2, lines 64-67 of US'986). Therefore, it would have been obvious to one having ordinary skill in the art to modify the briquette of US'986 to include the fluorspar known in the art in order to facilitate the thinning of slag.

Regarding claims 10 and 11, US'986 teaches the introducing the briquettes through the furnace roof via duct 21 which allows the material to fall directly into the center of the electrode delta formed by electrodes 29 (Col.5, line 66-Col.6, line 3 and Fig.2 of US'986).

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over US'986 in view of US'137, and further in view of Masucci et al (EP 0655508 A1, thereafter, EP'508).

US'986 in view of US'137 does not specify the presence of a reducing agent in the briquette. EP'508 teaches a process for producing foamed slag in stainless steel production in an electric arc furnace (Abstract of EP'508). EP'508 teaches the charging of silicon in order to protect the chromium in the bath from oxidation (Col.2, line 55 to Col.3 line 1 and Col.4, lines 1-2 of EP'508). It would have been obvious to one having ordinary skill in the art to adding reducing agent, such as silicon as demonstrated by EP'508 in the process of US'985 in view of US'137 in order to protect the chromium in the bath from oxidation (Col.2, line 55 to Col.3 line 1 and Col.4, lines 1-2 of EP'508).

(10) Response to Argument

The appellant's arguments filed on 3/15/2010 have been fully considered but they are not persuasive.

In the remarks, appellant argues: the combination of prior arts does not teach introducing preforms having a density adjusted by pressure and a type and quantity of an added iron carrier so that the preforms are heavier than the slag but lighter than the metal melt, as in the presently claimed invention. It is not inherent from the teachings of

Art Unit: 1793

US'986 that the briquette should be lighter than the metal melt and float in the slag near a phase boundary between the metal melt and the slag as recited in the instant claim 1.

In response, the Examiner disagrees with the appellant's argument because US'986 clearly teach the briquette formulations are 80-92 percent metallic iron (Abstract) for desired bulk density of the briquette (Table 1-4 and Col. 5, line 3 to Col.8, line 7 of US'986) and US'986 teaches a minimum effective density of about 1.5 times the density of said liquid slag (Claim 9 of US'986), and the briquettes may be introduced by gravity through the slag layer onto the molten metal bath (abstract and claim 9 of US'986).

US'986 further teach: forming rollers are applied to produce the pressed briquettes (Col.9, lines 27-47 of US'986). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the density of the preform by pressure and/or adding iron carrier as taught by US'986 in order to obtain briquettes with a desired size, shape and density (Col.9, lines 27-47 of US'986).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Jie Yang/

Jie Yang, Art Unit 1793

Art Unit: 1793

Conferees:

/ Roy King/

Supervisory Patent Examiner, Art Unit 1793

/Gregory L Mills/

Supervisory Patent Examiner, Art Unit 1700